Code: 9A05807

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B.Tech IV Year II Semester (R09) Regular Examinations, March/April 2013
WIRELESS SENSOR NETWORKS
(Common to CSE, IT & CSSE)

Time: 3 hours   Max. Marks: 70

Answer any FIVE questions.
All questions carry equal marks.

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1   (a)   Explain IEEE 802.11 protocol architecture in detail.
     (b)   Why cellular networks require handover? Explain the reason in detail.

2   (a)   Explain in detail about carrier sense multiple access scheme for reducing probability of collision.
     (b)   Write a short note on slotted aloha.

3   (a)   Explain the packet delivery to and from the mobile node using an example network.
     (b)   Explain in detail about dynamic host configuration protocol.

4   (a)   Explain the advantages and disadvantages of snooping TCP.
     (b)   Explain in detail about the mobile TCP.

5   (a)   Explain briefly the functional block diagram of typical sensor node.
     (b)   Explain in detail about the applications of wireless sensor networks.

6   (a)   What are the design issues of MAC protocols of wireless sensor networks?
     (b)   Write a short note on Query based routing.

7   (a)   Write a short note on sensor node hardware.
     (b)   Explain briefly about the augmented general purpose computer.

8   Write a short note on:
     (a)   NS-2
     (b)   TOSSIM.

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2

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1   (a)   Discuss about the three different physical layers supported by IEEE 802.11.
     (b)   Explain briefly the Bluetooth security components and protocols.

2   (a)   Explain how multi access with collision avoidance scheme solves the hidden terminal problem.
     (b)   Explain in detail about code division multiple access.

3   (a)   What is the need for registration in mobile computing? Explain the registration process.
     (b)   Explain in detail about the reverse tunneling.

4   (a)   What are the advantages and disadvantages of indirect TCP?
     (b)   Write a short note on snooping TCP.

5   (a)   Explain the features of ideal sensor node in detail.
     (b)   Explain how energy is conserved in sensor networks.

6   (a)   Briefly classify the different wireless sensor networks in detail.
     (b)   Explain in detail about the hierarchal based routing.

7   Explain in detail about the traditional embedded system programming interface.

8   (a)   Explain in detail about the timer component of field monitor application.
     (b)   Explain briefly about the implementation definition of timer component in nesC.

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3

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1   (a)   Explain briefly the advantages and disadvantages of radio transmission technology.
    (b)   Explain the functional architecture of a GSM system with a neat diagram.

2   Write a short notes on:
    (a)   FDMA
    (b)   TDMA.

3   (a)   Explain in detail about the agent discovery and agent advertisement.
    (b)   Explain different entities and terms associated with mobile IP.

4   (a)   What is slow start? Explain in detail about slow start mechanism of TCP.
    (b)   Write a short note on indirect TCP.

5   (a)   Why MANET's are not well suited for wireless sensor networks? Explain.
    (b)   Explain the challenges for routing protocols design for wireless sensor networks.

6   (a)   Explain briefly the hardware platform of a wireless sensor node.
    (b)   Explain the sequential assignment routing scheme in detail.

7   (a)   Explain the categories of different set of tradeoffs in the design choices of sensor
          node hardware.
    (b)   What is the problem in scale up for programming of sensor network?

8   (a)   Explain briefly about the interface definition of timer component in nesC.
    (b)   Explain briefly the component of node level simulator.

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Answer any FIVE questions
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1 (a) Explain in detail about the IEEE 802.11 MCA data frame and its fields.
(b) Explain briefly the advantages and disadvantages of infrared technology.

2 (a) Compare and contrast between SDMA and CDMA.
(b) Explain in detail about the hidden and exposed terminals.

3 Explain the following terms:
(a) Mobile node.
(b) Foreign agent.
(c) Case of address.
(d) Home agent.

4 (a) Explain the congestion control mechanism of TCP.
(b) What is selective transmission? How it is useful extension of TCP?

5 (a) Explain the advantages of wireless sensor networks over wired ones.
(b) Explain the reasons for not using traditional networks be used directly in wireless sensor networks. Why?

6 (a) What are the schemes to allocate single broadcast channel among the competing nodes? Explain.
(b) Explain some important goals that current research in the dynamic nature of wireless sensor networks.

7 Explain in detail about the MICA Mote architecture with a neat diagram.

8 (a) Write a short note on TINY OS.
(b) Explain in detail about the synchronous and asynchronous code of nesC.

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